Claims

Rule 1.126

1. A white-emitting LED with a defined color temperature, designed as a luminescence conversion LED, comprising a primary radiation source, which is a chip that emits in the blue spectral region, with in front of it a layer of two phosphors, both of which partially convert the radiation of the chip, characterized in that the first phosphor is from the class of the oxynitridosilicates having a cation M and the empirical formula $M_{(1-c)}Si_2O_2N_2:D_c$, where M comprises Sr as the main constituent and D is doped with divalent Europium, M = Sr or M = $Sr_{(1-x-y)}Ba_yCa_x$ with $0 \leq x+y < 0.5$ being used, the oxynitridosilicate completely or predominantly comprising the high-temperature-stable modification HT, and in that the second phosphor is a nitridosilicate of formula $(Ca,Sr)_2Si_5N_8:Eu$, producing a color temperature of from 2300 to 7000 K and at the same time achieving a color rendering of at least Ra = 80.

2. The LED as claimed in claim 1, characterized in that in the oxynitridosilicate the Eu fraction makes up between 0.1 and 20 mol% of M.

3. The LED as claimed in claim 1, characterized in that a proportion of M, in particular up to 30 mol%, is replaced by Ba and/or Ca and/or Zn.

4. The LED as claimed in claim 1, characterized in that a proportion of M, in particular up to 30 mol%, is replaced by Li and/or La and/or Na and/or Y.

5. The LED as claimed in claim 1, characterized in that a proportion of SiN, in particular up to 30 mol%, is replaced by AlO.

6. The LED as claimed in claim 1, characterized in that a proportion of Eu, in particular up to 30 mol%, is replaced by Mn.

7. The LED as claimed in claim 1, characterized in that the chip is an InGaN chip.

8. The LED as claimed in claim 1, characterized in that the LED is dimmable.

9. The LED as claimed in claim 1, characterized in that the LED has a color temperature of from 2700 to 3300 K.

10 ~~4.~~ The LED as claimed in claim 1, characterized in that the LED achieves the white luminous color by color mixing with the RGB principle, with the primary emission of the blue LED having a peak wavelength of from 430 to 470 nm.

11 ~~2.~~ The LED as claimed in claim 10, characterized in that the emission from the chip has a peak wavelength in the range from 450 to 465 nm.

12 ~~3.~~ The LED as claimed in claim 1, characterized in that the emission of the oxynitridosilicate has a dominant wavelength λ_{dom} in the range from 550 to 570 nm.

13 ~~4.~~ The LED as claimed in claim 1, characterized in that the nitridosilicate contains Sr as a permanent component, and Ca in a proportion of from 0 to 60 mol%.

14 ~~5.~~ The LED as claimed in claim 1, characterized in that the emission of the nitridosilicate has a dominant wavelength λ_{dom} in the range from 620 to 660 nm.

15 ~~6.~~ The LED as claimed in claim 1, characterized in that an Ra of at least 85 is achieved.

16 ~~7.~~ An illumination system having the LED as claimed in claim 1, characterized in that the system includes electronics for driving the individual LEDs or groups of LEDs.

17 ~~8.~~ The illumination system as claimed in claim 16, in which the electronic control includes means which impart dimmability.